

CLAIMS:

1. A method of manufacturing a semiconductor device comprising:
forming a thin film transistor of a type selected from the group consisting of a staggered type, a co-planer type, an inverted staggered type, and an inverted co-planer type;
forming an interlayer insulating film comprising silicon oxide over the thin film transistor;
forming an organic resin film over the interlayer insulating film;
forming a conductive layer comprising a conductive oxide by sputtering at a temperature not higher than 150°C; and
heating said conductive layer in an oxidizing atmosphere at a temperature of 200 to 400°C.
2. The method according to claim 1, wherein said semiconductor device is a display device.
3. The method according to claim 1, wherein said conductive layer comprises indium tin oxide.
4. The method according to claim 1, wherein said organic resin film comprises polyimide.
5. A method of manufacturing a semiconductor device comprising:
forming a thin film transistor of a type selected from the group consisting of a staggered type, a co-planer type, an inverted staggered type, and an inverted co-planer type wherein said thin film transistor has a channel region comprising semi-amorphous or semi-crystal silicon;
forming an interlayer insulating film comprising silicon oxide over the thin film transistor;
forming an organic resin film over the interlayer insulating film;
forming a conductive layer comprising a conductive oxide by sputtering at a temperature not higher than 150°C; and
heating said conductive layer in an oxidizing atmosphere at a temperature of 200 to 400°C.

6. The method according to claim 5, wherein said semiconductor device is a display device.

7. The method according to claim 5, wherein said conductive layer comprises indium tin oxide.

8. The method according to claim 5, wherein said organic resin film comprises polyimide.

9. A method of manufacturing a semiconductor device comprising:
forming a semiconductor film comprising amorphous silicon on an insulating surface;
heating said semiconductor film to crystallize said semiconductor film;
forming an interlayer insulating film comprising silicon oxide over the semiconductor film;
forming at least one contact hole in said interlayer insulating film to expose an impurity region of said semiconductor film;
forming an electrode on said interlayer insulating film wherein said electrode is connected to said impurity region through said contact hole;
forming an organic resin film over said electrode and said interlayer insulating film;
forming a conductive layer comprising a conductive oxide by sputtering at a temperature not higher than 150°C; and
heating said conductive layer in an oxidizing atmosphere at a temperature of 200 to 400°C wherein said conductive layer is electrically connected to said electrode through a contact hole of said organic resin film.

10. The method according to claim 9, wherein said semiconductor device is a display device.

11. The method according to claim 9, wherein said conductive layer comprises indium tin oxide.

12. The method according to claim 9, wherein said organic resin film comprises polyimide.

13. A method of manufacturing a semiconductor device comprising:
forming a thin film transistor of a type selected from the group consisting of a staggered type, a co-planer type, an inverted staggered type, and an inverted co-planer type;
forming an interlayer insulating film comprising silicon oxide over the thin film transistor;
forming a planarizing film comprising a resin over the interlayer insulating film;
forming a conductive layer comprising a conductive oxide by sputtering at a temperature not higher than 150°C; and
heating said conductive layer in an oxidizing atmosphere at a temperature of 200 to 400°C.

14. The method according to claim 13, wherein said semiconductor device is a display device.

15. The method according to claim 13, wherein said conductive layer comprises indium tin oxide.

16. The method according to claim 13, wherein said planarizing film comprises polyimide.

17. A method of manufacturing a semiconductor device comprising:
forming a thin film transistor of a type selected from the group consisting of a staggered type, a co-planer type, an inverted staggered type, and an inverted co-planer type wherein said thin film transistor has a channel region comprising semi-amorphous or semi-crystal silicon;
forming an interlayer insulating film comprising silicon oxide over the thin film transistor;
forming a planarizing film comprising a resin over the interlayer insulating film;
forming a conductive layer comprising a conductive oxide by sputtering at a temperature not higher than 150°C; and
heating said conductive layer in an oxidizing atmosphere at a temperature of 200 to 400°C.

18. The method according to claim 17, wherein said semiconductor device is a display device.

19. The method according to claim 17, wherein said conductive layer comprises indium tin oxide.

20. The method according to claim 17, wherein said planarizing film comprises polyimide.

21. A method of manufacturing a semiconductor device comprising:
forming a semiconductor film comprising amorphous silicon on an insulating surface;
heating said semiconductor film to crystallize said semiconductor film;
forming an interlayer insulating film comprising silicon oxide over the semiconductor film;
forming at least one contact hole in said interlayer insulating film to expose an impurity region of said semiconductor film;
forming an electrode on said interlayer insulating film wherein said electrode is connected to said impurity region through said contact hole;
forming a planarizing film comprising a resin over the interlayer insulating film;
forming a conductive layer comprising a conductive oxide by sputtering at a temperature not higher than 150°C; and
heating said conductive layer in an oxidizing atmosphere at a temperature of 200 to 400°C wherein said conductive layer is electrically connected to said electrode through a contact hole of said organic resin film.

22. The method according to claim 21, wherein said semiconductor device is a display device.

23. The method according to claim 21, wherein said conductive layer comprises indium tin oxide.

24. The method according to claim 21, wherein said planarizing film comprises polyimide.